

# Forms of Energy

## Notes

<http://www.brainpop.com/science/energy/formsofenergy/>

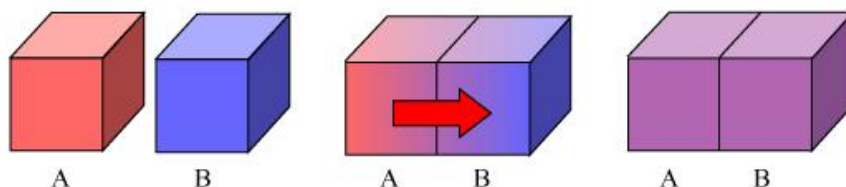
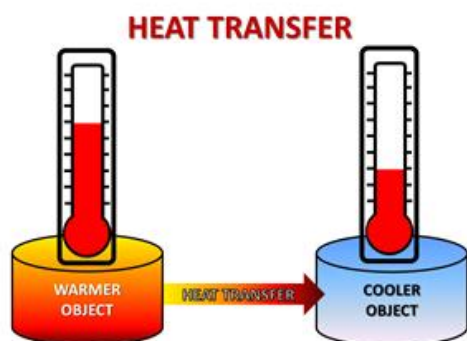
### Thermal energy

energy of moving particles

The faster the particles move, the more heat energy they have

Thermal energy moves from warmer objects to colder objects

All matter has some heat energy



<http://www.brainpop.com/science/energy/heat/>

### Light energy

energy of electromagnetic waves

Electromagnetic waves

can travel through a space with no matter (vacuum)

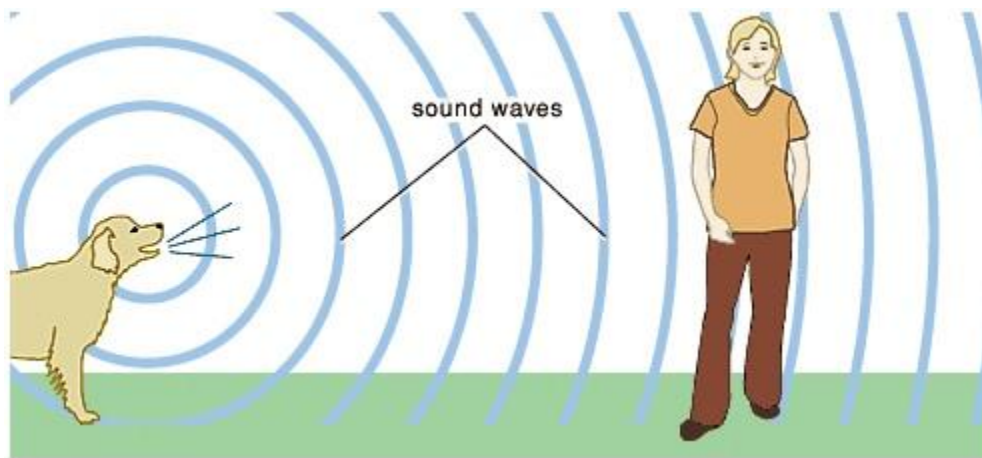
<http://www.brainpop.com/science/energy/electromagneticspectrum/>

Examples of  
electromagnetic  
waves

- light waves
- microwaves
- radio waves
- x-rays

### **Sound energy**

energy produced by vibrating  
objects



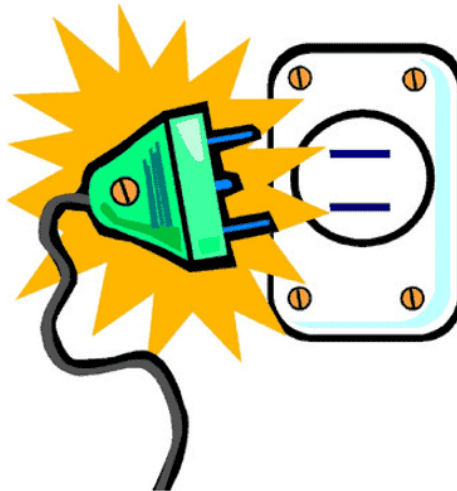
Sound energy CANNOT travel  
through a vacuum

<http://www.brainpop.com/science/energy/sound/>

### **Electrical energy**

energy of moving electrons

It is carried on an electric current



Electric appliances change electric energy into other forms of energy

### Chemical energy

energy that is released during a chemical reaction or chemical change

The energy is stored in the bonds between atoms

Chemical energy holds particles of matter together

Examples of chemical energy

- battery
- fuel (coal, oil, natural gas)
- lighting a match
- food

### Mechanical energy

the ability to do work

It is the sum of potential energy and kinetic energy

Machines use mechanical energy to do work

Two types of mechanical energy

- potential energy
- kinetic energy

### Potential energy

the energy an object has because of its position

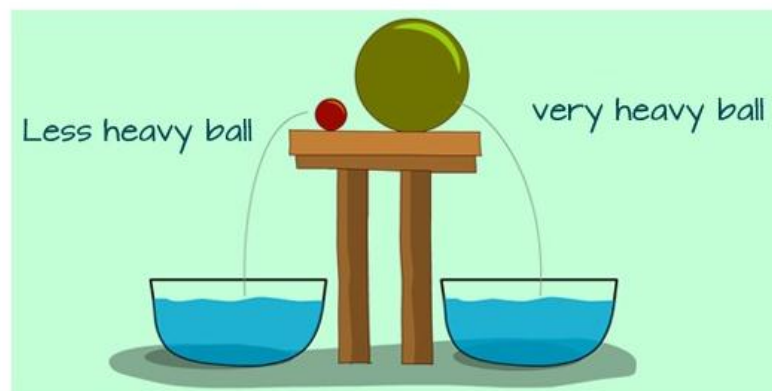
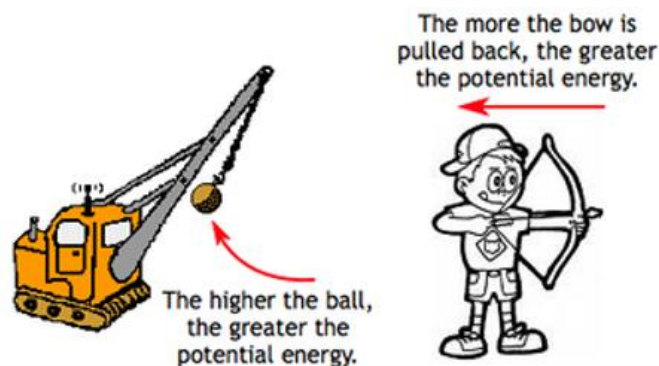
It is stored energy

An object has the possibility of moving

Mass and height

affect potential energy:

- the more mass an object has, the more potential energy it has
- the farther an object has to fall, the more potential energy it has



Examples of  
potential energy

- ball at the top of a hill
- stretched rubber band



<http://www.brainpop.com/science/energy/potentialenergy/>

**Kinetic energy**

the energy of motion



Mass and velocity

affect kinetic energy:

- the faster an object moves, the more kinetic energy it has
- the more mass a moving object has, the more kinetic energy it has

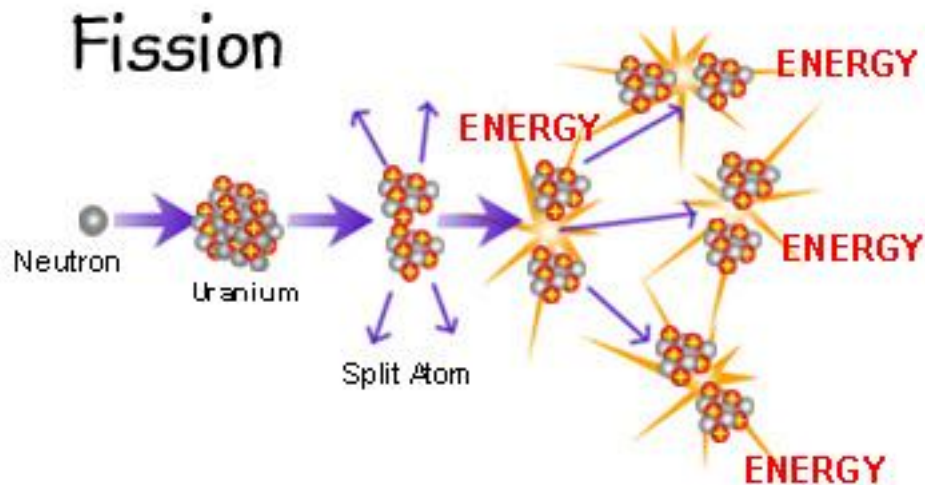
<http://www.brainpop.com/science/energy/kineticenergy/>

## **Nuclear energy**

energy in the nucleus of an atom

Fission

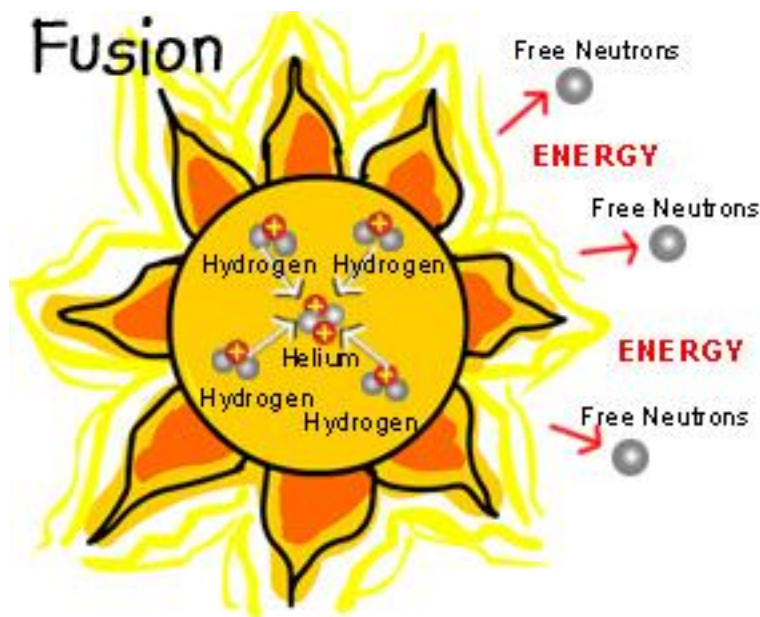
nuclear energy is released when the nuclei of heavy atoms are split apart



Fusion

nuclear energy is released when the nuclei of lighter atoms combine

This is how the energy of the sun is produced



<http://www.brainpop.com/science/energy/nuclearenergy/>

## Forms of Energy

### Check Your Understanding

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1. Which picture is an example of renewable energy?

*The picture of \_\_\_\_\_ energy is an example of renewable energy.*

2. What kind of energy is in the battery of a wristwatch?

*The kind of energy that is in the battery of a wristwatch is \_\_\_\_\_ energy.*

3. Give some examples of how we use energy.

*We use energy to \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.*



4. What forms of energy help you learn in school?

*The forms of energy that help me learn at school are \_\_\_\_\_ energy to \_\_\_\_\_ and \_\_\_\_\_ energy to \_\_\_\_\_ .*

## Forms of Energy

### Science Skill

#### Visualizing

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1. List three examples of potential energy.

*Three examples of potential energy are \_\_\_\_\_ , \_\_\_\_\_ , and \_\_\_\_\_ .*

2. List three examples of kinetic energy using your answers from Question 1.

*Three examples of kinetic energy from the answers above are \_\_\_\_\_ , \_\_\_\_\_ , and \_\_\_\_\_ .*

Energy sources can be

- renewable
- nonrenewable

Renewable energy source

energy that comes from natural sources and does not run out



Examples of  
renewable energy

- solar
- wind
- hydropower
- geothermal
- biomass



## **Hydropower**

energy from moving water

<http://www.brainpop.com/technology/energytechnology/dams/>



Nonrenewable  
energy source

energy that is used faster than it  
can be replaced

Example of  
nonrenewable  
energy source

fossil fuels

<http://www.brainpop.com/science/energy/gasandoil/>

Fossil fuels

fuel formed from the remains of  
plants and animals

Types of fossil  
fuels

- coal
- oil

- natural gas



<http://www.brainpop.com/technology/energytechnology/fossilfuels/>

Sound energy

travels on waves

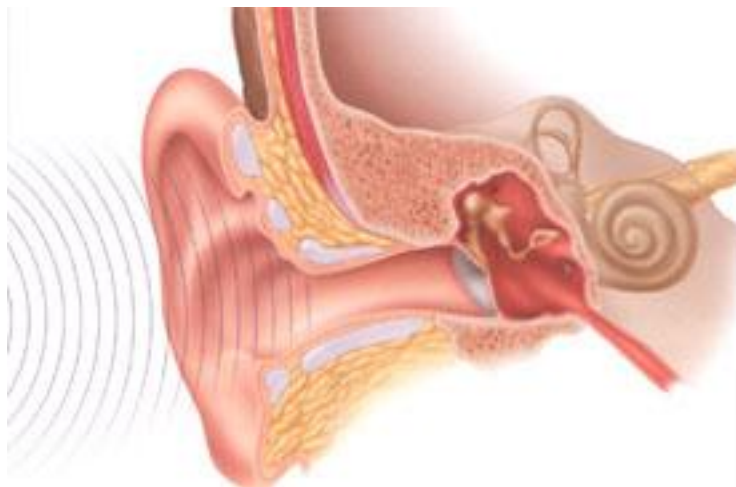
How we hear  
sound

an object vibrates, then causes the  
air around it to vibrate

The vibrations travel on sound  
waves in the air to your ears

The sound waves enter your ears

Tiny bones in the ears vibrate and  
you hear sound



## Forms of Energy

### Check Your Understanding

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1. When does a soccer ball have kinetic energy?

*A soccer ball has kinetic energy when it \_\_\_\_\_ .*

2. What are three renewable energy sources?

*Three sources of renewable energy are \_\_\_\_\_ , \_\_\_\_\_ , and \_\_\_\_\_ .*

3. How does sound energy travel from an instrument to your ear?

*Sound energy travels from an instrument to your ear when \_\_\_\_\_ .*

4. When did the soccer ball have the most potential energy? When did it have the least potential energy?

*The soccer ball has the most potential energy when it is \_\_\_\_\_ . It has the least potential energy when it is \_\_\_\_\_ .*

